Land and Water
British Columbia Inc.

BRITISH
COLUMBIA

Ministry of Agriculture
Food and Fisheries

Guide to Completing Shellfish Management Plans

British Columbia Assets & Land Corporation/Ministry of Agriculture, Food and Fisheries

Shellfish Unit

Suite 501, 345 Wallace Street Nanaimo BC V9R 5B6

Tel: (250) 741-5669 Fax: (250) 741-5686

Introduction

All aquaculture operations, whether on Crown Land or Private Land, are required to submit a completed Management Plan. The Shellfish Management Plan is required for all shellfish farms, whether marine or freshwater, land based or water based. Oyster, clam, mussel, and culturists of other invertebrates must complete this plan.

This guide is intended to help you fill out the Shellfish Management Plan. Please follow the guide carefully and fill the plan out completely as this is the minimum amount of information that will be accepted. An incomplete plan or incorrect information will cause delays in review of your proposal and may result in disallowance of your application. If your application is an expansion of existing farm, ensure your Shellfish Management Plan covers both the existing and proposed new area and activities.

PLEASE COMPLETE IN INK & USE ADDITIONAL SHEETS IF NECESSARY

Cover Page

Provide your Name, Address, Postal Code, and Telephone Numbers. The name on the Management Plan must be the same as on the Aquaculture License Application and, if applicable, the Crown Land application forms.

Indicate the appropriate specie(s) that you will be culturing and whether this is a first time application, an amendment of an existing plan or a new plan for a replacement tenure. If an amendment or replacement, please provide the Ministry of Agriculture, Food and Fisheries Aquaculture Licence number, and if applicable, the Coast Guard File Number and the Land and Water British Columbia Inc. (LWBC) Land File Number in the appropriate boxes at the bottom of the page.

Indicate the status of the land on which the operation is situated. With few exceptions WATER BASED operations are on Provincial Crown Land. WATER BASED operations are those conducted below the high tide mark. LAND BASED operations are those conducted above the high tide mark on dry land. Check the box that applies to your operation. For example, oyster longlines, or clam beds etc., are WATER BASED operations. An oyster nursery employing tanks on the upland would be a LAND BASED facility.

Finally, indicate the status of the land that the operation will be located on (e.g. Provincial Crown Land, Federal Harbour, or port, etc.)

Section A: Description of the Site

1. Provide the Legal Description of the site (Land District and Legal Lot Number) e.g. *District Lot 319, Sayward District or Unsurveyed Foreshore Sproat Bay, Barclay District.*

2. Provide a general Geographic Description of the Site, e.g. *On the North side of Hayle Bay on Broughton Island.*

3. Provide the geographic coordinates (latitudes and longitudes) of the centre of your proposed site and indicate the number of the marine chart used.

4. Calculate the overall area of your site to the nearest one-tenth hectare. Metric units are preferred. One acre = 0.4 ha. One hectare = 2.47 acres (One acre = 4047m^2 and One hectare = 10,000 m^2).

Section B: Scale of Operations

1. Provide the following information about your farm at full production. This information to be consistent with site diagram.

(a) Total production hectares (grow-out): Indicate the total area in hectares dedicated to production of stock from seed to market size.

(b) Total non-production hectares: Indicate the total area for secondary use(s) such as seed holding, stock conditioning, depuration, temporary stock holding etc.

(c) Total unusable hectares: Indicate the total area that is unsuitable for aquaculture but is included within the tenure boundaries because it simplifies delineation of the site. For example areas with either rocky or soft substrate unsuitable for aquaculture as well as the area taken up with anchors and anchor lines as these must lie within the tenure boundaries.

(d) Grow-out system refers to the type of culture method utilized. Beach culture takes place on the intertidal zone. Near bottom refers to culture that occurs in the intertidal zone but is raised off the bottom (e.g. stake, rack and bag). Deepwater refers to culture suspended in deepwater or on the seabed, below the low tide mark.

(e) Total length of longline____metres and/or the total number of structures (stakes, racks, rafts, etc.)____ that will be on the site when under full production. Ensure that these numbers are consistent with your site layout diagram.

(f) Number of grow-out units (trays, strings, tubes, socks, etc.)____ per metre of longline and/or____per structure.

(g) Provide details on the size and carrying capacity of the specific grow-out units you intend to use with respect to the species cultured.

2. The Schedule of Improvements provides a list of all facilities to be installed on site, their individual areas, and the dates on which their construction is to be completed. Be sure to include the site modifications and state the dimensions of all structures installed for your shellfish operation i.e. work floats, breakwaters, substrate supplementation, lease markers, vexar fences, predator netting etc. Please see attached example, **Appendix 1.**

3. The Planned Seeding Table must detail your five-year plan for seed acquisition for each species you plan to culture. Show actual years (i.e. 2000, 2001, etc.) that the seeding will take place. It is assumed that after 5 years you will have attained a stable seeding regime. Seed units can be shown as singles (in which case indicates size), vexar bags or tubes. Please see attached example in **Appendix 2.**

4. The Planned Production Table must detail your five-year plan for production for each species you plan to culture. Year 1 refers to the first year you will have a marketable product and you need to show the actual years (i.e. 2000, 2001, etc.) that the production will occur. Ensure that you record your production in actual production units (kilograms, dozens, gallons etc.) and not dollars. Minimum and maximum refers to the possible range of your production. It is assumed that you will have attained full production after your fifth year and that the figures for year 5 and onward will remain the same until the tenure on the lease/license expires or another plan is drafted. The seed portion of this section is to be filled out only if you are producing seed for sale. Please see attached example in **Appendix 3.**

Section C: Operational Facilities and Layout

This section is comprised of a series of diagrams.

1. Location Map: a **Canadian Hydrographic Services** marine chart (original or photocopy) of the area (1:40,000 scale) that clearly shows the location of the area under application and any resources or other uses that you are aware of, such as hatcheries, other shellfish/finfish farms, streams/creeks, important habitats (eelgrass beds, kelp beds saltmash), log sorts, log booming grounds, tourist or recreational facilities, boat havens and anchorages, pollution sources, national/provincial parks, First Nation Reserves, important wildlife areas, areas of cultural or heritage significance, etc. Please see attached example - **Appendix 4.**

2. Operational Layout Diagram: a top view scaled plan, preferably 1:5000 or less that clearly illustrates the nature of the operation. The site boundaries, dimensions, position of anchors (must be within the tenure boundaries) and all facilities such as rafts, longlines, racks, netting cover, perimeter fencing etc. and their respective dimensions must be shown. Substrate types, tide levels, low watermarks, depth contours, wind fetch and current vectors showing direction and speed, and unusable area of the tenure must be indicated. Delineate the areas of the site each species will be cultured and areas of secondary use such as seed holding, stock conditioning, etc. If beach modification is being proposed indicate proposed changes in beach profile and substrate composition. (NB: Beach modifications may require an Authorization under the *Fisheries Act* – see Table 1.0). For tenure applications over deep water, show as accurately as possible the low water mark (LWM), the 10-metre level and the distance from the LWM to the inshore tenure boundary. Location of other facilities either existing or proposed (wharves, access roads, staff facilities, portable washrooms) should also be stated. This information is necessary to determine any infringements of riparian rights, impacts on fish / wildlife habitat and navigational issues. Please see attached examples **Appendix 5(a), 5(b).**

   For land based operations an aerial or top view scaled diagrams of 1:5000 or less is required. All ponds, raceways, tanks etc. must be depicted, as they would be in actual operation. All water sources, intake and outlet locations, and all proposed buildings and outdoor facilities must be clearly illustrated. If Crown upland modification is required, show area(s) to be modified and indicate proposed changes.

3. Details of Operational Components: profile view diagrams of each operational component that includes the following (as applicable):

   - Type, length and diameters of all ropes, cables, etc.;
   - Type, weight and number of anchors and scope of anchor lines;
   - Length of, and distance between, grow-out units (strings, trays, tubes, socks, etc,);
   - Make / type, spacing and working buoyancy of flotation;
   - Construction details of rafts, racks, bins etc. Include a top view, as well as a side view and overall dimensions;
   - Attachment details of longlines and rafts to shore and to anchors, and raft to raft;
   - Predator netting and perimeter fencing/stakes.

   Please see attached **Appendix 6 (a, b, c, d, & e).**

Section D: Land Use Operations (1 & 2 for Land Based Operations Only)

1. Type of System. Indicate the type of system that best describes your operation. If none of the provided options accurately reflects the farm system, indicate *other* and describe.

2. Main Water Source. Provide information of the waterbody that you will draw from. Ensure you show the source on the Site Layout Diagram.

- Provide geographic description of water body you plan to draw water from.
- Indicate whether Environment Canada has surveyed.
- Calculate the maximum amount of water that will be required and the amount that will be discharged per day. For example if you need a flow rate of 1,000 L/hr. then your flow rate is 24,000 L/day.
- Indicate the depth of the intake and discharge below MLW.
- Indicate any effluent treatment planned.
- Land based operations should show a side view of the ponds tanks, raceways, etc., and a depiction of the flow of water through the facilities from intake to outlet.

Section E: Environmental Information/Management Plan

Fisheries and Oceans Canada is responsible for the protection and management of fish habitat under the authority of the *Fisheries Act* and may request plans, specifications and environmental assessments specific to marine projects where more information is required.

If the proposed project includes the installation of structures (vexar fences, predator netting, rafts), beach modification (removal of rocks, gravelling, beach contouring, rock berm construction, tilling, the use of heavy equipment) or lethal predator control, the project may require approval under s.s. 5(1) of the *Navigable Waters Protection Act* (NWPA) and/or Authorization under s.s. 32 and /or 35(2) of the *Fisheries Act*. For all deep-water applications, the project will most likely require s.s. 5(1) approval under the NWPA. The issuance of an NWPA approval or a FA Authorization requires DFO-HEB to conduct a screening level review pursuant to the *Canadian Environmental Assessment Act* (CEAA). The table below summarizes those situations where a DFO-HEB approval and the subsequent CEAA review are required. If the associated activities listed in the Table below are not part of the proposal, DFO would not have a regulatory role in the approval of the tenures.

The proponent may also wish to contact the Canadian Coast Guard, Navigable Waters Protection Division or DFO-HEB directly to discuss the project.

Table 1.0: Activities associated with shellfish aquaculture that trigger a review under CEAA.

DFO Approval	Lethal Predator Control	Vexar Fences	Predator Netting	Berm Construction	Longline Deepwater Operation	Rock Removal	Gravelling	Tilling	Beach Hardening*	Heavy Equipment on Beach
NWPA s.s.5(1)	×	✓	✓	?	✓	×	×	×	?	×
Fisheries Act S.32	✓	×	×	×	×	×	×	×	×	×
Fisheries Act s.s.35(2)	×	?	?	✓	×	✓	✓	✓	?	✓

✓ - requires an environmental assessment under CEAA
× - does not require an environmental assessment under CEAA
? - may require an environmental assessment under CEAA depending on the exact nature of the activity
* - may depend on location and tray stack height

Rationale for Environmental Management Package:

1 & 2. The *Fisheries Act* prohibits "the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water". Wastewater has the potential to elevate the biochemical oxygen demand of the water column. The deposit of organisms (mussels, algae) that foul in-water equipment can cause a smothering effect on the benthic communities below as well as deplete oxygen in the water column through decomposition.

- Describe how you will deal with sewage disposal and the disposal of unused materials (i.e. rope ends, netting, paint cans, oil containers, garbage).

3. The Canadian Shellfish Survey Program (CSSP) is responsible for the continuing evaluation of the level of contamination in the water overlying shellfish growing areas and their classification as to sanitary quality. Specify if the main water source has been inspected by Environment Canada, the date the survey was completed and any outcomes from the survey must be indicated. Contact Burt Kooi, Shellfish Biologist at Environment Canada for further information at (604) 924-2582.

4. The **Fisheries Act** prohibits "harmful alterations, disruption or destruction (HADD) of fish habitat," while the **Canadian Environmental Assessment Act** (CEAA) is concerned with "any change that a project may cause in the environment, including any effect of any change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by aboriginal purposes, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance; and, any change to the project that may be caused by the environment". For these reasons, it is important that shellfish farmers are aware of, not only the potential impact the environment may have on their operations, but also, the impact their operations may have on the environment during the installation, operation and decommissioning phases. These considerations must also be addressed during the siting and planning phases of the operation.

   Please read this section of the Environmental Management Plan and sign to indicate you have read the section and are willing to undertake the necessary mitigation measures if your operation or operating practices are found to be negligent.

5. Please complete the Marine Foreshore Environmental Assessment Procedure in full. See **Appendix 7.** Contact Scott Northrup, Habitat and Enhancement Branch, DFO at 250-756-7275 if you have any questions regarding this procedure.

Appendix 1 – Schedule of Improvements

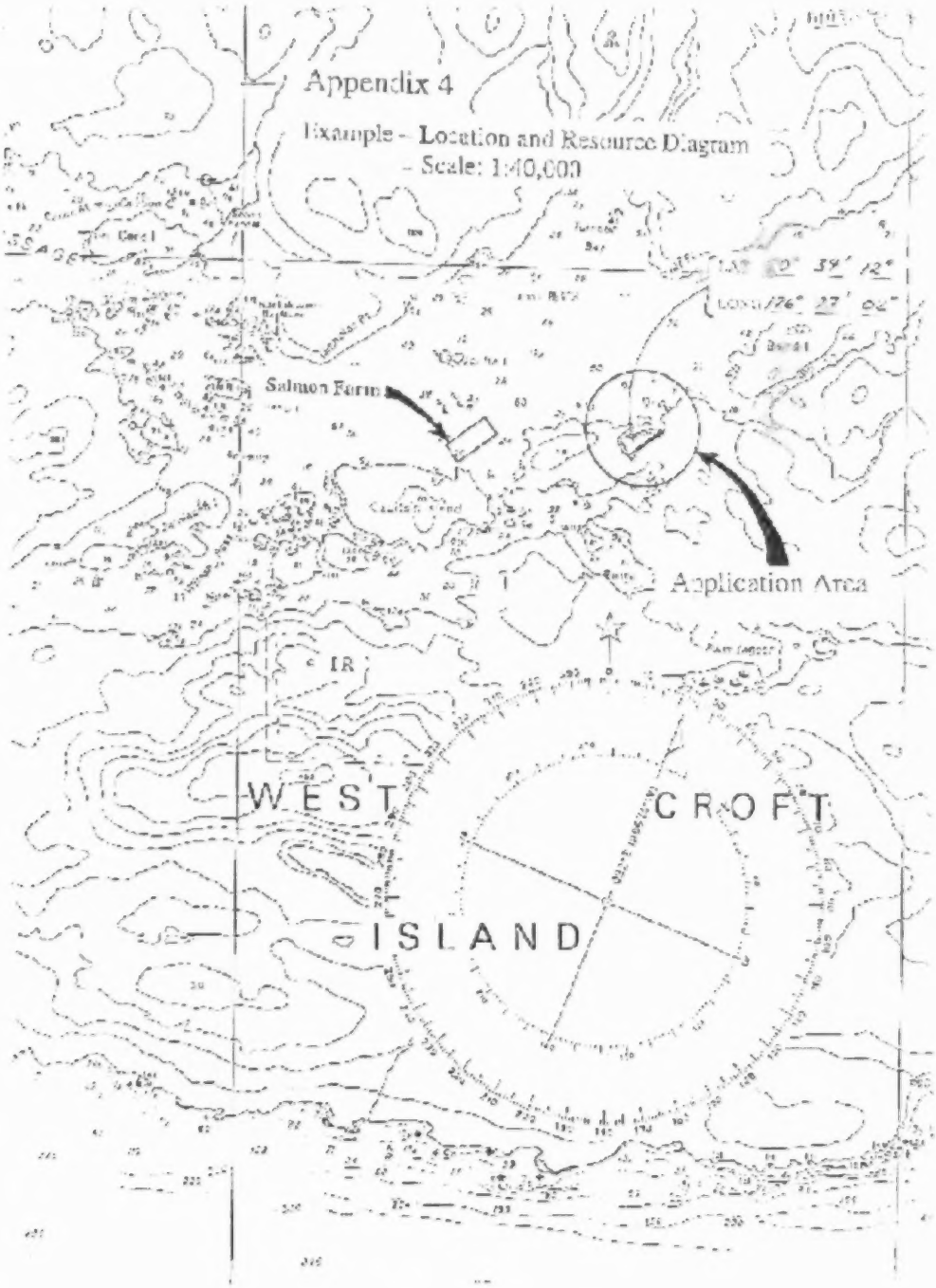
Description of Improvements	Total Area Covered	Date of Completion
3 double Longlines (oysters)	0.25 ha	December 2000
3 additional double longlines		December 2002
3 additional double longlines		December 2003
Protective netting (clams)		
Two (2) mussel rafts with predator netting	0.20 ha	December 2001
Two (2) mussel rafts with predator netting	0.025 ha	December 2001 December 2002

Appendix 2 – Planned Seeding

Species	Year 1 = 2000	Year 2 = 2001	Year 3 = 2002	Year 4 = 2003	Year 5 = 2004	Seed Units
Pacific Oyster (C.gigas)	100	100	100	100	100	Vexar Bags
Manila Clam (T.philip.)	100,000	200,000	400,000	400,000	400,000	6-8 mm Singles
Mussels (M.gallo)		2,000,000	4,000,000	4,000,000	4,000,000	singles

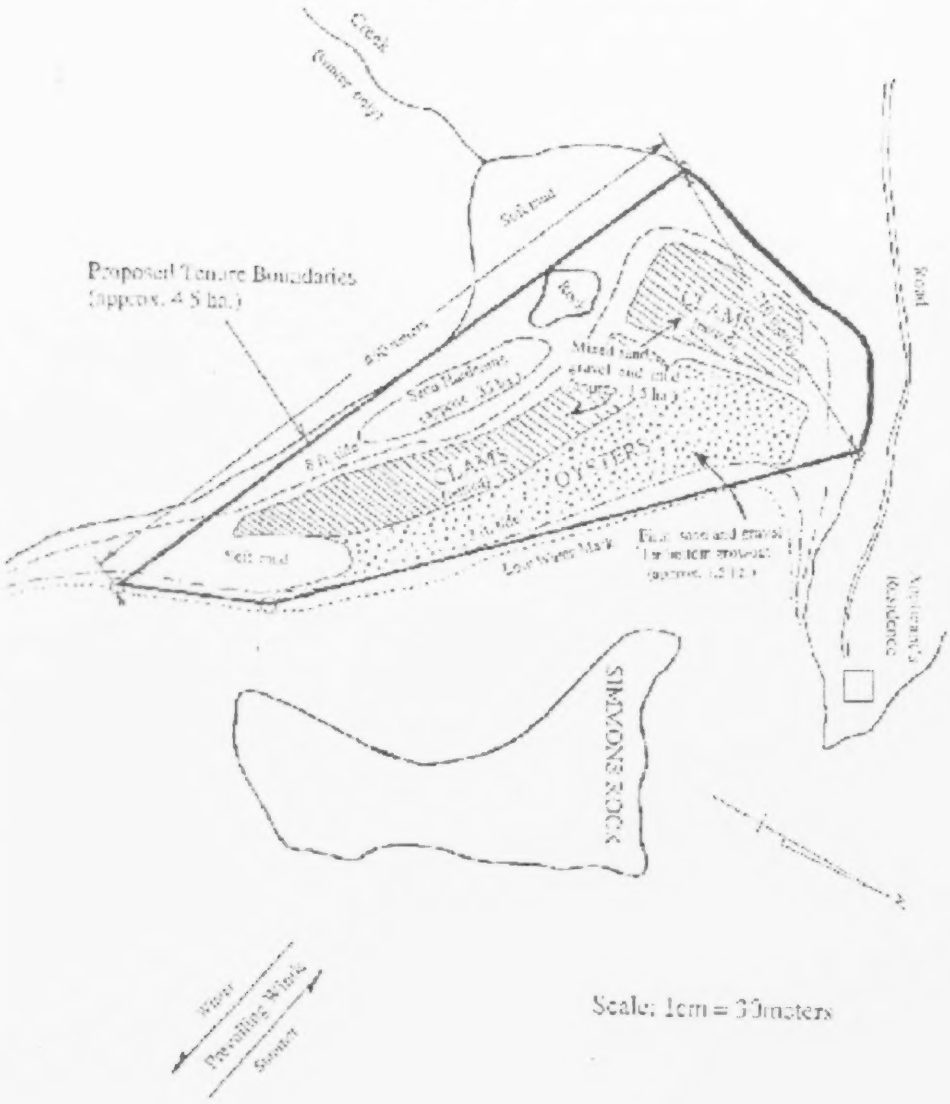
Appendix 3 - Planned Production

Species	Class	Year 1 = 2002		Year 2 = 2003		Year 3 = 2004		Year 4 = 2005		Year 5 = 2006		Units (not $)
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Pacific Oysters (C.gigas)	Market Size			100	250	100	250	100	250	100	250	U.S. Gallon
	Seed	50	50	50	50	50	50	50	50	50	50	Vexar Lg Seed
Manila Clams (T.philip.)	Market Size	500	1500	1000	3000	2000	6000	2000	6000	2000	6000	Kg
	Seed											
Mussels (M.gallo.)	Market Size	9K	18K	18K	36K	18K	36K	18K	36K	18K	36K	Kg
	Seed											
	Market Size											
	Seed											
	Market Size											
	Seed											


Appendix 4
Example - Location and Resource Diagram
- Scale: 1:40,000
Salmon Farm
Application Area
IR
WEST
CROFT
ISLAND

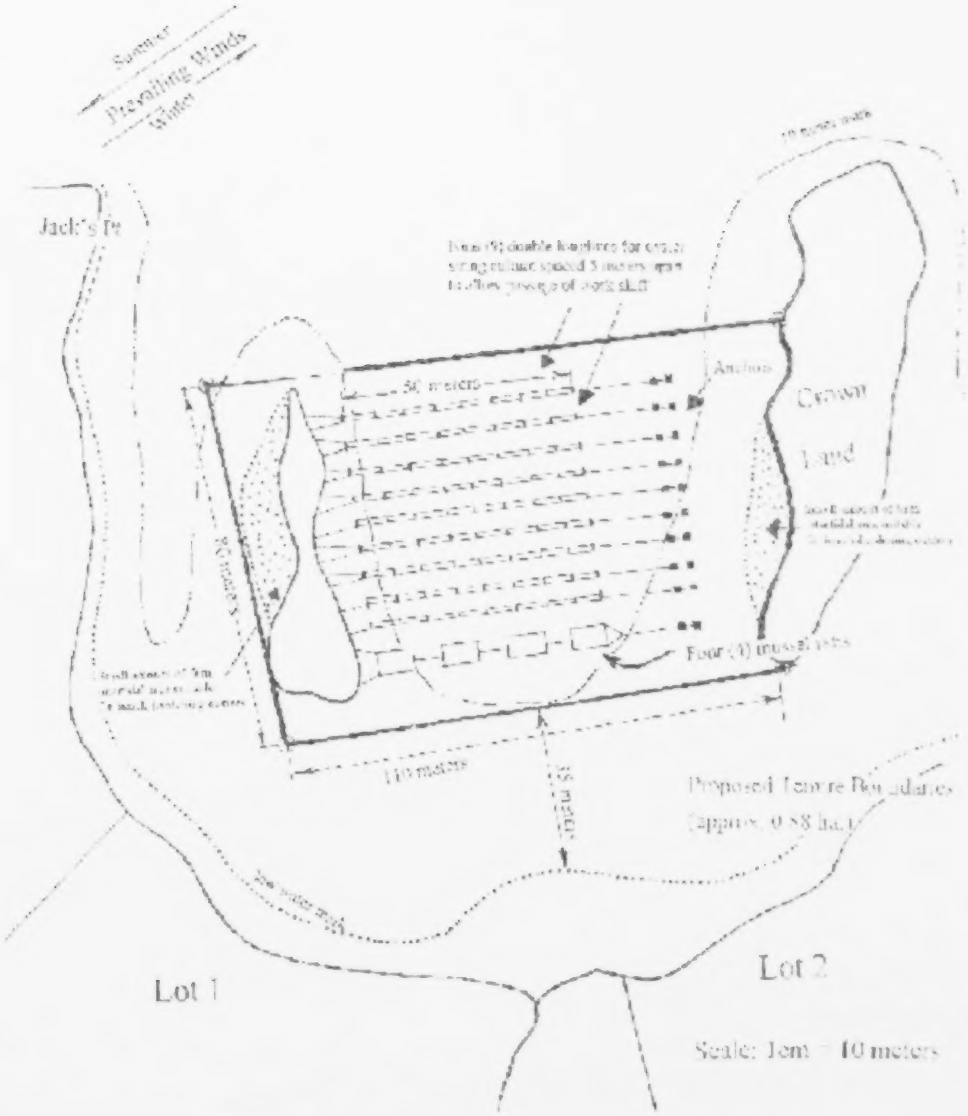
Appendix 5(a)

Example Operational Layout
(Beach)

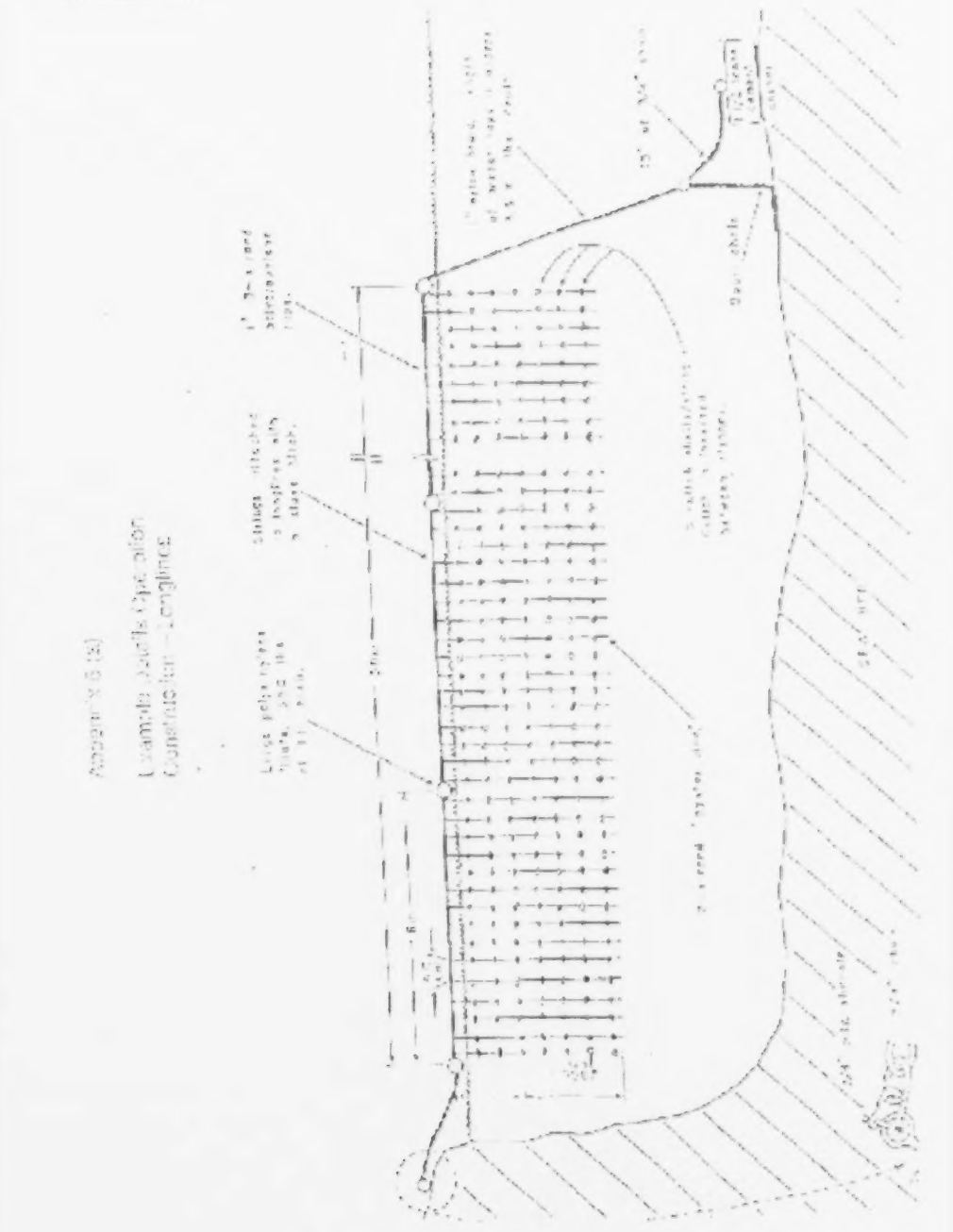


Appendix (5b)

Example – Operational Layout
(Deep Water)

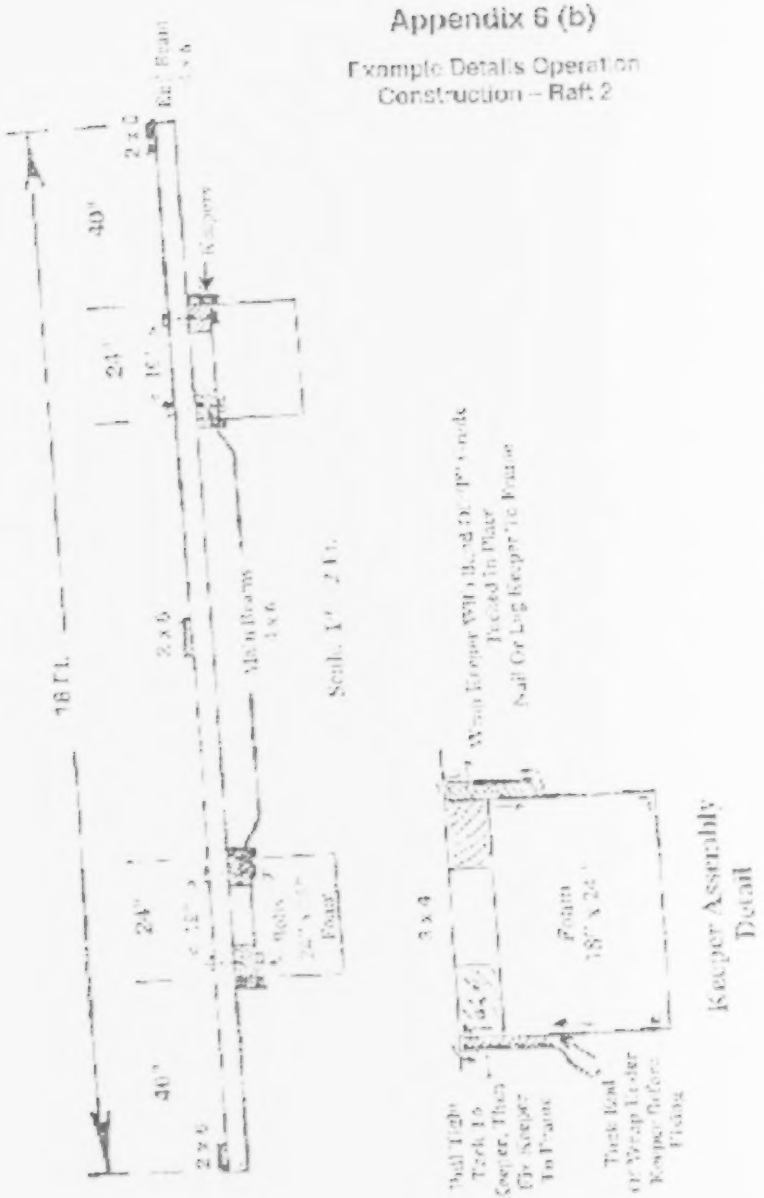


Appendix 6(a)



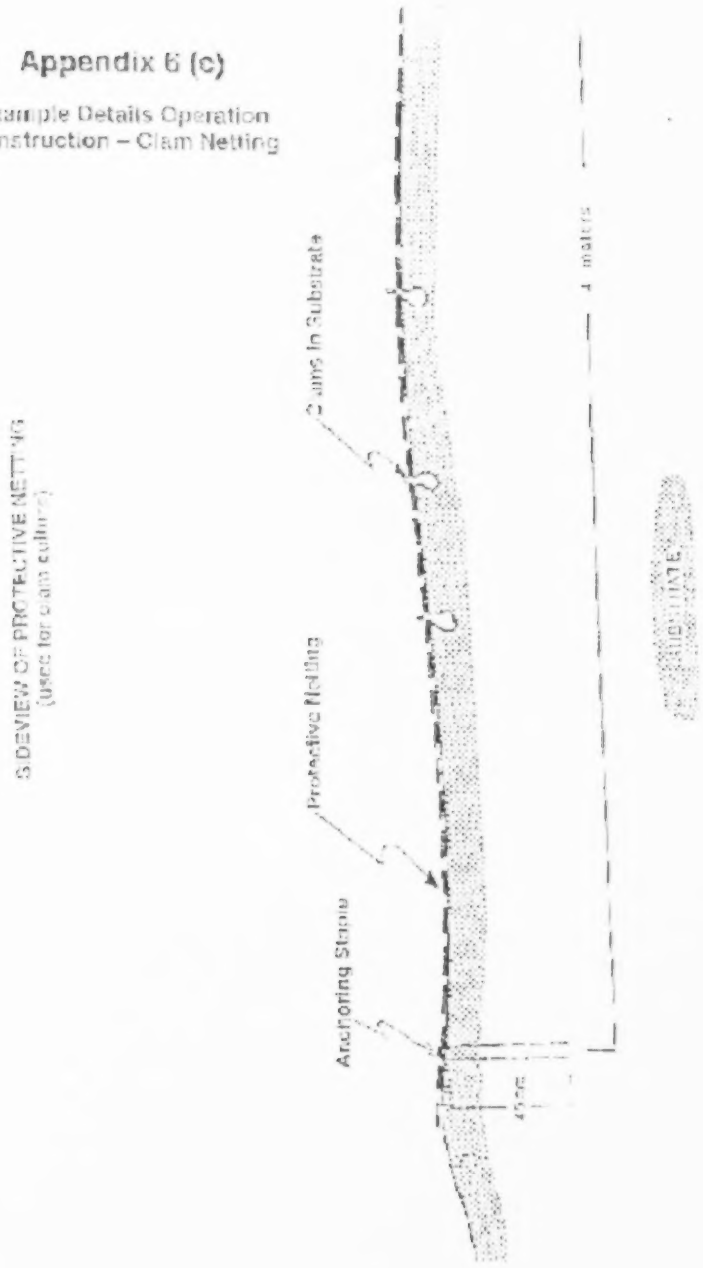
Appendix 6 (b)

Example Details Operation
Construction – Raft 2



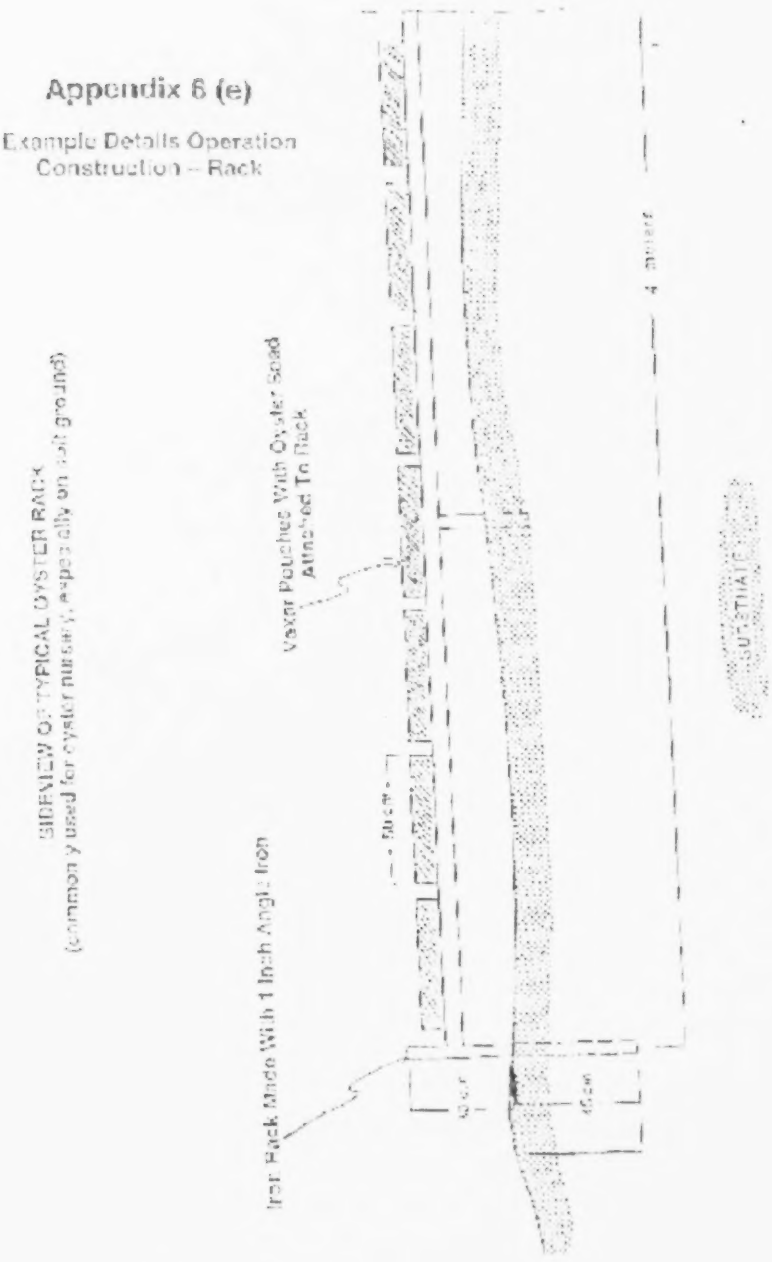
Appendix 6 (c)

Example Details Operation
Construction – Clam Netting



Appendix 6 (e)

Example Details Operation
Construction – Rack



Appendix 8: Contact Information

Land and Water British Columbia Inc.
Shellfish Unit
Jim Russell
Suite 501, 345 Wallace Street
Nanaimo, BC V9R 5B6
(250) 741-5681
http://www.bc-land-assets.com

Ministry of Agriculture, Food and Fisheries
Barron Carswell
PO Box 9359
780 Blanchard St.
Stn. Provincial Government
Victoria, BC V8W 9M2
http://www.gov.bc.ca/fish/

Ministry of Water Land and Air Protection

Arlene Tompkins
2080 Labieux Road
Nanaimo BC V9T 6J9
(250) 751-3227

and/or

Michael Wilcox
2nd floor, 10470-152nd Street
Surrey BC V3R 0Y3
(604) 582-5356

http://www.gov.bc.ca/elp/

DEPARTMENT OF FISHERIES AND OCEANS

Regional Aquaculture Coordination Office
Andrew Morgan
350-555 West Hastings St.
Vancouver, BC V6B 5G3
(604) 666-7009
http://www.pac.dfo-mpo.gc.ca/sci/aqua/pages/aquaco.htm

Canadian Coast Guard – NWPD
Jim Naylor
300-555 West Hastings St.
Vancouver, BC V6B 5G3
(604) 775-5486
http://www.pacific.ccg-gcc.gc.ca/nwp/index.htm

Habitat and Enhancement Branch

South Coast Office:
Scott Northrup
3225 Stephensen Point Rd.
Nanaimo, BC V9T 1K3
(250) 756-7275

North Coast Office:
Shelley Jepps
PO Box 10
Port Hardy, BC V0N 2P0
(250) 902-0429

Central Coast Office:
Patty Menning
215 - 940 Alder Street
Campbell River, BC V9W 2P8
(250) 850-5704
http://www-heb.pac.dfo-mpo.gc.ca/

Major Projects Review Unit (CEAA)
Paula Doucette
1220a-555 West Hastings St.
Vancouver, BC V6B 5G3
(604) 666-7017
http://www-heb.pac.dfo-mpo.gc.ca/

Sean Wouters (First Nations Enquiries)
1220a-555 West Hastings St.
Vancouver, BC V6B 5G3
(604) 666-0287

Fisheries Management Branch
Kerry Marcus
60 Front St.
Nanaimo, BC V9R 5H7
(250) 754-0210
http://www.pac.dfo-mpo.gc.ca/ops/fm/fishmgmt.htm

Environment Canada
Environmental Protection Branch
Adrian Duncan
224 West Esplanade
North Vancouver, BC V7M 3H7
(604) 666-0670
http://www.pyr.ec.gc.ca

Canadian Shellfish Sanitation Program
Hal Nelson
Pollution Prevention & Assessment Division
224 West Esplanade
North Vancouver, BC V7M 3H7
(604) 666-2947
http://www.pyr.gc.ca/ep/shellfish/shell_e.htm

Canadian Wildlife Service
Andrew Robinson
Pacific Wildlife Research Centre
RR#1, 5421 Robertson Rd.
Delta, BC V4K 3N2
(604) 940-4685
http://www.cws-scf.ec.gc.ca/cwshom_e.html